# UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27532

CSAH 123

OVER THE

CROW RIVER

DISTRICT 5 –HENNEPIN COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 110)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27532, Piers 1 and 2, were in good condition with no structurally significant defects observed. A portion of the footing was exposed at the downstream section of both Piers 1 and 2 with no undermining detected. A minor accumulation of timber debris was observed at the downstream section of Pier 2, and a localized scour depression was observed at the upstream end of the upstream portion of Pier 1.

INSPECTION FINDINGS:

(A) A scour depression, 0.5 feet deep and 3 feet in radius, was observed at the upstream end of the upstream portion of Pier 1.

(B) The footing was exposed along the north face of the downstream section of Pier 1 from the upstream nose to the downstream quarter point with up to 1 foot of vertical face exposure.

(C) The footing was exposed for 2 feet along the south side of the upstream nose of the downstream section of Pier 2 with up to 5 inches of vertical face exposure.

(D) A minor accumulation of timber debris, up to 6 inches in diameter, was observed at the upstream nose of the downstream portion of Pier 2.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27532

Feature Crossed: The Crow River

Feature Carried: CSAH 123

Location: District 5 - Hennepin County

Bridge Description: The structure consists of three spans of a concrete deck supported by multiple steel stringers. The superstructure is supported by two concrete piers and two concrete abutments. The piers are number 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 28, 2002

Weather Conditions: Rain, "50$^{o}$ F

Underwater Visibility: "1 foot

Waterway Velocity: "1.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Piers 1 and 2 consist of two sections: an original rectangular concrete shaft with a pointed upstream nose and a rounded downstream nose that rests upon a rectangular footing/seal combination supported by concrete piles, and a newer rectangular concrete shaft with rounded noses that rests upon a rectangular footing supported by concrete piles.

Maximum Water Depth at Substructure Inspected: Approximately 9.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the parapet at the east end of Pier 2.

Water Surface: The waterline was approximately 26.5 feet below reference. Assumed Waterline Elevation = 73.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

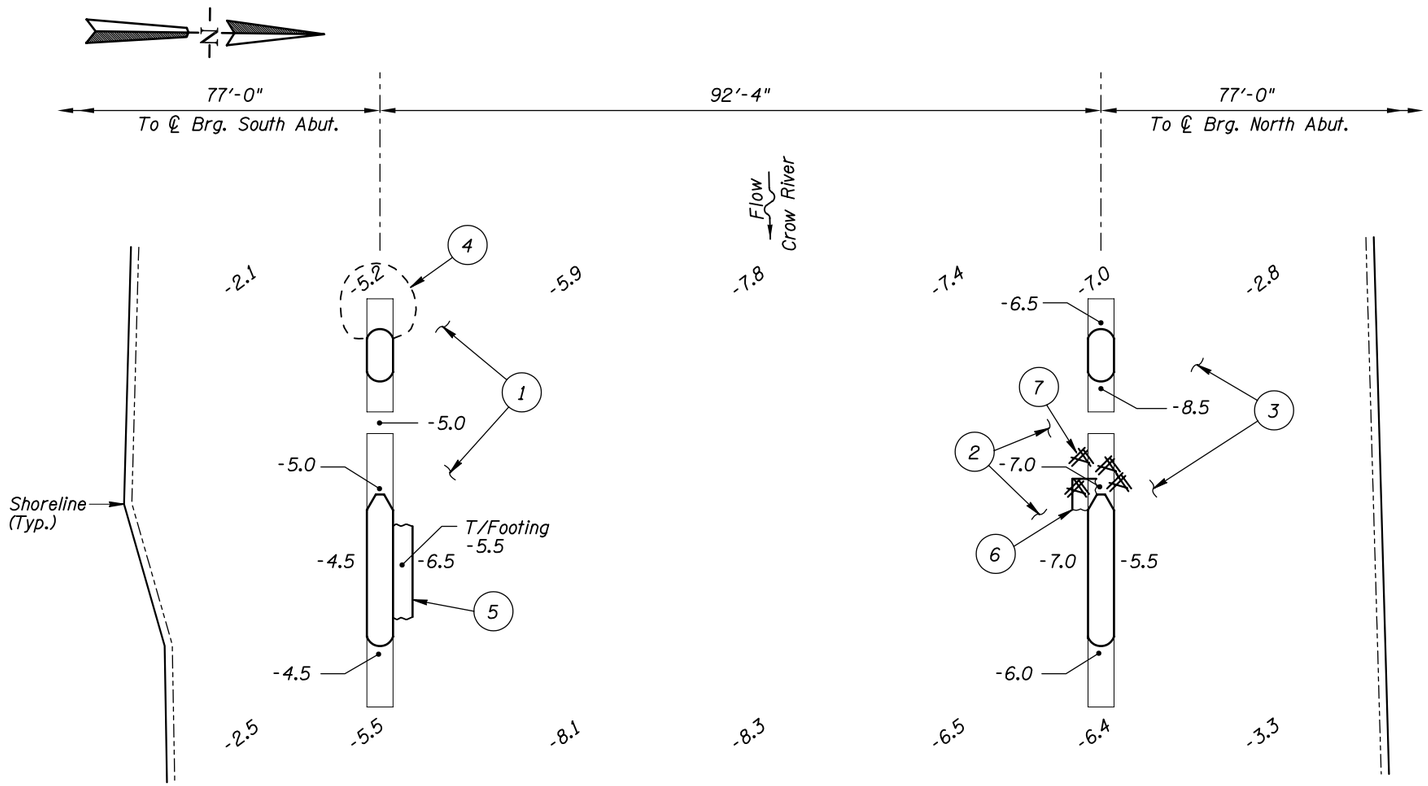
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/02

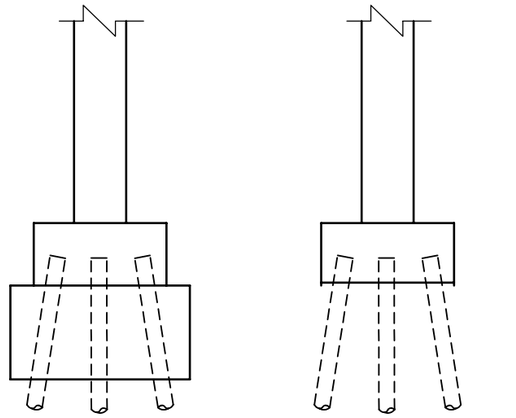
Item 113: Scour Critical Bridges: Code N/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes _X_ No




SOUNDING PLAN



TYPICAL DOWNSTREAM END VIEW OF PIERS

TYPICAL UPSTREAM END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on September 28, 2002, the waterline was located approximately 26.5 feet below the top of the parapet at the downstream end of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 73.5.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of sandy gravel and 8-inch-diameter riprap with up to 4 inches of probe rod penetration.

(2) The channel bottom consisted of sandy gravel with up to 4 inches of probe rod penetration.

(3) The channel bottom consisted of riprap up to 2 feet in diameter.

(4) A scour depression, 0.5 feet deep and 3 feet in radius, was observed at the upstream end of Pier 1.

(5) The footing was exposed along the north face of the downstream section of Pier 1 with up to 1 foot of vertical face exposure.

(6) The footing was exposed at the upstream nose of the downstream portion of Pier 2 with up to 5 inches of vertical face exposure.

(7) A minor accumulation of timber debris, with pieces up to 6 inches in diameter, was observed at the upstream nose of the downstream portion of Pier 2.

Legend

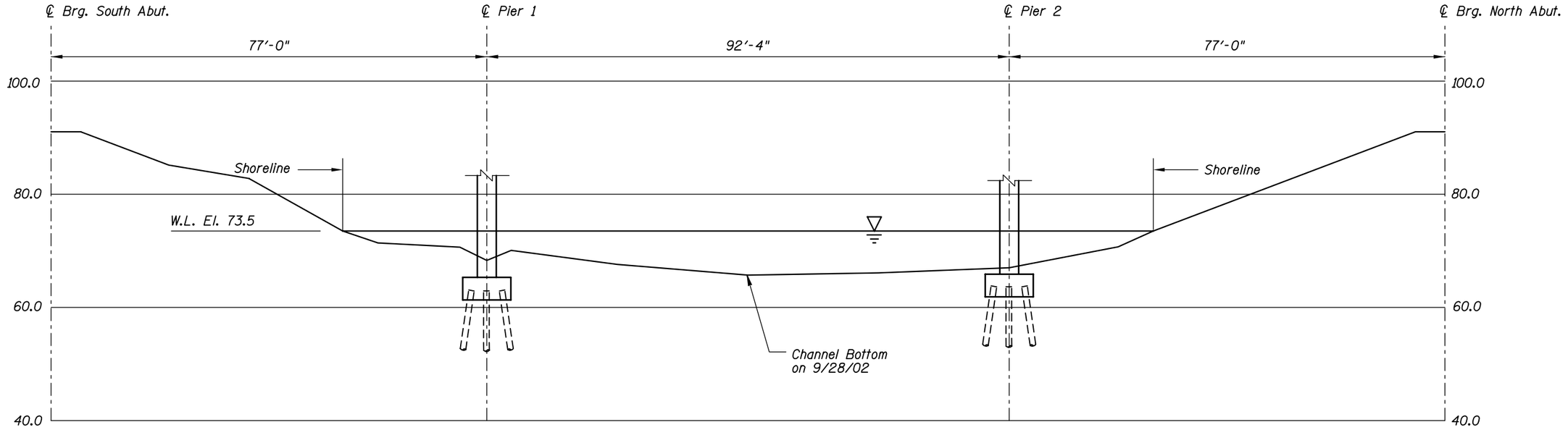
| | |
|---|---|
| -3.8 | Sounding Depth from Waterline (9/28/02) |
| | Timber Debris |
| | Scour Depression |

**MINNESOTA**
**DEPARTMENT OF TRANSPORTATION**
**UNDERWATER BRIDGE INSPECTION**

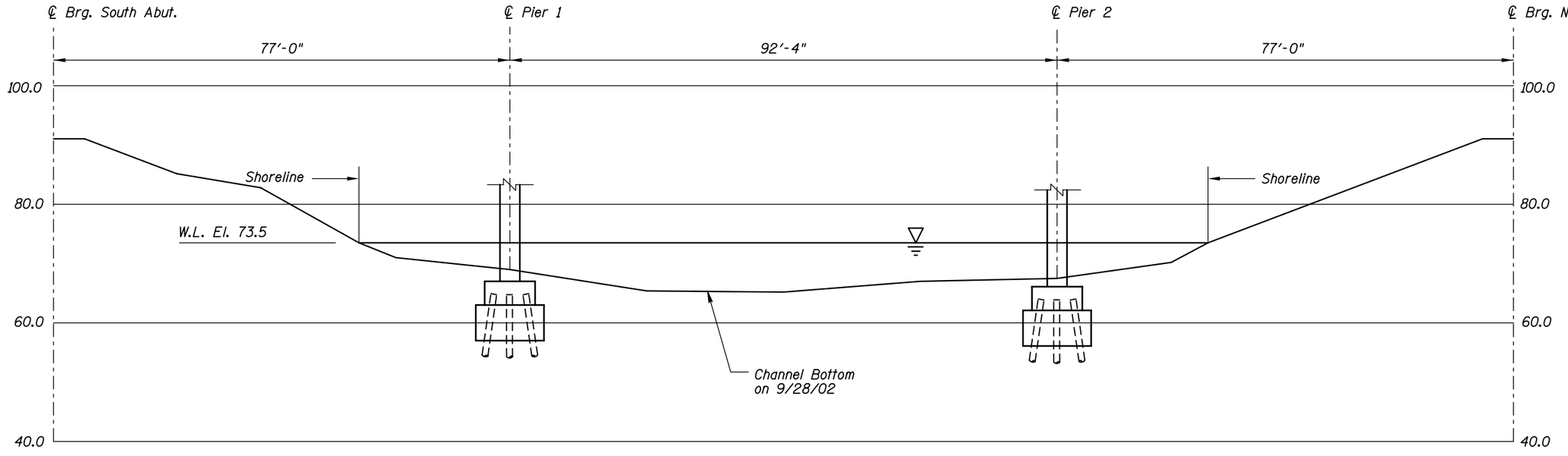
STRUCTURE NO. 27532
OVER THE CROW RIVER
DISTRICT 5, HENNEPIN COUNTY

# INSPECTION AND SOUNDING PLAN

| | | |
|---|---|---|
| Drawn By: PRH | COLLINS ENGINEERS, INC. | Date: SEPT. 2002 |
| Checked By: MDK | 300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300 | Scale: NTS |
| Code: 35120110 | | Figure No.: 1 |




UPSTREAM FASCIA PROFILE




DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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DISTRICT 5, HENNEPIN COUNTY

# UPSTREAM AND DOWNSTREAM FASCIA PROFILES

| | | |
|---|---|---|
| Drawn By: PRH | **COLLINS ENGINEERS, INC.** | Date: SEPT. 2002 |
| Checked By: MDK | 300 W. WASHINGTON, STE. 600<br>CHICAGO, ILLINOIS 60606<br>(312) 704-9300 | Scale: 1"=20' |
| Code: 35120110 | | Figure No.: 2 |

Photograph 1. Overall View of Structure, Looking Northeast.

Photograph 2. View of Pier 1, Looking Northeast.

Photograph 3. View of Pier 2, Looking South.

Photograph 4. View of New Upstream Shaft of Pier 2, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 28, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 27532 WEATHER: Rain, "50° F
WATERWAY CROSSED: Crow River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: SCUBA, U/W Light, Scraper, Lead Line, Probe Rod, Camera
TIME IN WATER: 3:15 p.m.
TIME OUT OF WATER: 4:00 p.m.
WATERWAY DATA: VELOCITY "1.5 fps
VISIBILITY " 1 feet
DEPTH 9 feet at Pier 2
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: Overall, the concrete of the piers was in good and sound condition with no structurally significant defects observed. Portions of the downstream section of both piers exhibited footing exposure with up to 1 foot of vertical exposure and no undermining detected. A minor scour depression, 0.5 foot deep and 3 feet in radius, was observed at the upstream end of Pier 1. A minor accumulation of timber debris was observed at the upstream nose of the downstream portion of Pier 2. The downstream portion of both piers exhibited small areas of concrete repair patches approximately 4 feet above the waterline.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

# UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27532
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Crow River

INSPECTION DATE September 28, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

## CONDITION RATING

| | | | SUBSTRUCTURE | | | | | | CHANNEL | | | | | GENERAL | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT REFERENCE NO. | | MAXIMUM DEPTH OF WATER | PILING | COLUMNS, SHAFTS, OR FACES* | FOOTINGS | DISPLACEMENT | OTHER | OVERALL SUBSTRUCTURE CONDITION CODE* | SCOUR | EMBANKMENT EROSION | EMBANKMENT PROTECTION | OTHER (DRIFT/DEBRIS) | OVERALL CHANNEL & PROTECTION CONDITION | CONCRETE | STEEL | TIMBER | LOSS OF SECTION | PREVIOUS REPAIR OR MAINTENANCE | OTHER |
| | UNIT DESCRIPTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | Pier 1 | 6.5’ | N | 7 | 7 | 9 | N | 7 | 7 | 8 | 8 | N | 7 | 7 | N | N | N | 7 | N |
| | Pier 2 | 9.0’ | N | 7 | 7 | 9 | N | 7 | 7 | 8 | 8 | 7 | 7 | 7 | N | N | N | 7 | N |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in good and sound condition with no structurally significant defects observed. Portions of the downstream section of both piers exhibited footing exposure with up to 1 foot of vertical exposure and no undermining detected. A minor scour depression, 0.5 foot deep and 3 feet in radius, was observed at the upstream end of Pier 1. A minor accumulation of timber debris was observed at the upstream nose of the downstream portion of Pier 2. The downstream portion of both piers exhibited small areas of concrete repair patches approximately 4 feet above the waterline.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.